

NEEDLE & ROSENBERG

IMPORTANT FAX DOCUMENT

NEEDLE & ROSENBERG PC
SUITE 1000
999 PEACHTREE STREET
ATLANTA, GEORGIA 30309-3915
678-420-9300
NEEDLE&ROSENBERG.COM

DATE March 17, 2004

NAME Examiner Rao, MN
Group Art Unit 1632

COMPANY US Patent and Trademark Office

FAX NUMBER 571/273-0939

FROM Jo Anne W. Tyson for Janell Cleveland, Patent Agent

REFERENCE NO. Application No. 09/990,874
Attorney Docket No. 07121.0003U1

OUR FAX NUMBER 678-420-9301

NUMBER OF PAGES ~~80~~ 36 PAGES (PART II OF II)

Examiner Rao, regarding the above-referenced patent application, attached is our last response to the July 15, 2003 Office Action, and a postcard with the date of receipt affixed by the PTO. Please call me at 678/420-9340 if you need anything further. Thank you, Janell Cleveland, Patent Agent

CONFIDENTIALITY NOTE

The information which follows and is transmitted herewith is attorney privileged, trade secret and confidential information intended only for viewing and use of the individual or entity named above. If the reader of this message is not the intended recipient, you are hereby notified that any review, use, communication, dissemination, distribution or copying of this communication is strictly prohibited. If you have received this communication in error, please immediately notify us by telephone and return the original message to us at the above address.



From

To

SEQUENCE LISTING
"Xylanases With Enhanced
Thermophilicity and Alkalophilicity
(Sung)
Application No. 09/990,874
Our Docket No. 07121.0003U1

* MAILER

With Care

FIRST CLASS MAIL

ATTORNEY DOCKET NO. 07121.0003U1

SEQUENCE LISTING

<110> Sung, Wing

<120> Xylanases with Enhanced Thermophilicity and Alkalophilicity

<130> 07121.0003U1

<140> 09/990,874

<141> 2001-11-21

<160> 71

<170> PatentIn version 3.0

<210> 1

<211> 184

<212> PRT

<213> Aspergillus niger

<400> 1

Ser Ala Gly Ile Asn Tyr Val Gln Asn Tyr Asn Gly Asn Leu Gly Asp
1 5 10 15

Phe Thr Tyr Asp Glu Ser Ala Gly Thr Phe Ser Met Tyr Trp Glu Asp
20 25 30

Gly Val Ser Ser Asp Phe Val Val Gly Leu Gly Trp Thr Thr Gly Ser
35 40 45

Ser Asn Ala Ile Thr Tyr Ser Ala Glu Tyr Ser Ala Ser Gly Ser Ser
50 55 60

Ser Tyr Leu Ala Val Tyr Gly Trp Val Asn Tyr Pro Gly Ala Glu Tyr
65 70 75 80

Tyr Ile Val Glu Asp Tyr Gly Asp Tyr Asn Pro Cys Ser Ser Ala Thr
85 90 95

Ser Leu Gly Thr Val Tyr Ser Asp Gly Ser Thr Tyr Gln Val Cys Thr
100 105 110

Asp Thr Arg Ile Asn Glu Pro Ser Ile Thr Gly Thr Ser Thr Phe Thr
115 120 125

Gln Tyr Phe Ser Val Arg Glu Ser Thr Arg Thr Ser Gly Thr Val Thr
130 135 140

Val Ala Asn His Phe Asn Phe Trp Ala Gln His Gly Phe Gly Asn Ser
145 150 155 160

Asp Phe Asn Tyr Gln Val Met Ala Val Glu Ala Trp Ser Gly Ala Gly
165 170 175

ATTORNEY DOCKET NO. 07121.0003U1

Ser Ala Ser Val Thr Ile Ser Ser
180

<210> 2

<211> 185

<212> PRT

<213> Aspergillus tubigenensis

<400> 2

Ser Ala Gly Ile Asn Tyr Val Gln Asn Tyr Asn Gln Asn Leu Gly Asp
1 5 10 15

Phe Thr Tyr Asp Glu Ser Ala Gly Thr Phe Ser Met Tyr Trp Glu Asp
20 25 30

Gly Val Ser Ser Asp Phe Val Val Gly Leu Gly Gly Trp Thr Thr Gly
35 40 45

Ser Ser Asn Ala Ile Thr Tyr Ser Ala Glu Tyr Ser Ala Ser Gly Ser
50 55 60

Ala Ser Tyr Leu Ala Val Tyr Gly Trp Val Asn Tyr Pro Gln Ala Glu
65 70 75 80

Tyr Tyr Ile Val Glu Asp Tyr Gly Asp Tyr Asn Pro Cys Ser Ser Ala
85 90 95

Thr Ser Leu Gly Thr Val Tyr Ser Asp Gly Ser Thr Tyr Gln Val Cys
100 105 110

Thr Asp Thr Arg Ile Asn Glu Pro Ser Ile Thr Gly Thr Ser Thr Phe
115 120 125

Thr Gln Tyr Phe Ser Val Arg Glu Ser Thr Arg Thr Ser Gly Thr Val
130 135 140

Thr Val Ala Asn His Phe Asn Phe Trp Ala His His Gly Phe His Asn
145 150 155 160

Ser Asp Phe Asn Tyr Gln Val Val Ala Val Glu Ala Trp Ser Gly Ala
165 170 175

Gly Ser Ala Ala Val Thr Ile Ser Ser
180 185

<210> 3

<211> 185

<212> PRT

<213> Bacillus circulans

ATTORNEY DOCKE1 NO. 07121.0003U1

<400> 3

Ala Ser Thr Asp Tyr Trp Gln Asn Trp Thr Asp Gly Gly Gly Ile Val
1 5 10 15

Asn Ala Val Asn Gly Ser Gly Gly Asn Tyr Ser Val Asn Trp Ser Asn
20 25 30

Thr Gly Asn Phe Val Val Gly Lys Gly Trp Thr Thr Gly Ser Pro Phe
35 40 45

Arg Thr Ile Asn Tyr Asn Ala Gly Val Trp Ala Pro Asn Gly Asn Gly
50 55 60

Tyr Leu Thr Leu Tyr Gly Trp Thr Arg Ser Pro Leu Ile Glu Tyr Tyr
65 70 75 80

Val Val Asp Ser Trp Gly Thr Tyr Arg Pro Thr Gly Thr Tyr Lys Gly
85 90 95

Thr Val Lys Ser Asp Gly Gly Thr Tyr Asp Ile Tyr Thr Thr Thr Arg
100 105 110

Tyr Asn Ala Pro Ser Ile Asp Gly Asp Arg Thr Thr Phe Thr Gln Tyr
115 120 125

Trp Ser Val Arg Gln Ser Lys Arg Pro Thr Gly Ser Asn Ala Thr Ile
130 135 140

Thr Phe Thr Asn His Val Asn Ala Trp Lys Ser His Gly Met Asn Leu
145 150 155 160

Gly Ser Asn Trp Ala Tyr Gln Val Met Ala Thr Glu Gly Tyr Gln Ser
165 170 175

Ser Gly Ser Ser Asn Val Thr Val Trp
180 185

<210> 4

<211> 201

<212> PRT

<213> Bacillus pumilus

<400> 4

Arg Thr Ile Thr Asn Asn Glu Met Gly Asn His Ser Gly Tyr Asp Tyr
1 5 10 15

Glu Leu Trp Lys Asp Tyr Gly Asn Thr Ser Met Thr Leu Asn Asn Gly
20 25 30

Gly Ala Phe Ser Ala Gly Trp Asn Asn Ile Gly Asn Ala Leu Phe Arg
35 40 45

Lys Gly Lys Lys Phe Asp Ser Thr Arg Thr His His Gln Leu Gly Asn
50 55 60

ATTORNEY DOCKET NO. 07121.0003U1

Ile Ser Ile Asn Tyr Asn Ala Ser Phe Asn Pro Ser Gly Asn Ser Tyr
65 70 75 80

Leu Cys Val Tyr Gly Trp Thr Gln Ser Pro Leu Ala Glu Tyr Tyr Ile
85 90 95

Val Asp Ser Trp Gly Thr Tyr Arg Pro Thr Gly Ala Tyr Lys Gly Ser
100 105 110

Phe Tyr Ala Asp Gly Gly Thr Tyr Asp Ile Tyr Glu Thr Thr Arg Val
115 120 125

Asn Gln Pro Ser Ile Ile Gly Ile Ala Thr Phe Lys Gln Tyr Trp Ser
130 135 140

Val Arg Gln Thr Lys Arg Thr Ser Gly Thr Val Ser Val Ser Ala His
145 150 155 160

Phe Arg Lys Trp Glu Ser Leu Gly Met Pro Met Gly Lys Met Tyr Glu
165 170 175

Thr Ala Phe Thr Val Glu Gly Tyr Gln Ser Ser Gly Ser Ala Asn Val
180 185 190

Met Thr Asn Gln Leu Phe Ile Gly Asn
195 200

<210> 5

<211> 185

<212> PRT

<213> Bacillus subtilus

<400> 5

Ala Ser Thr Asp Tyr Trp Gln Asn Trp Thr Asp Gly Gly Gly Ile Val
1 5 10 15

Asn Ala Val Asn Gly Ser Gly Gly Asn Tyr Ser Val Asn Trp Ser Asn
20 25 30

Thr Gly Asn Phe Val Val Gly Lys Gly Trp Thr Thr Gly Ser Pro Phe
35 40 45

Arg Thr Ile Asn Tyr Asn Ala Gly Val Trp Ala Pro Asn Gly Asn Gly
50 55 60

Tyr Leu Thr Leu Tyr Gly Trp Thr Arg Ser Pro Leu Ile Glu Tyr Tyr
65 70 75 80

Val Val Asp Ser Trp Gly Thr Tyr Arg Pro Thr Gly Thr Tyr Lys Gly
85 90 95

Thr Val Lys Ser Asp Gly Gly Thr Tyr Asp Ile Tyr Thr Thr Arg
100 105 110

ATTORNEY DOCKET NO. 07121.0003U1

Tyr Asn Ala Pro Ser Ile Asp Gly Asp Arg Thr Thr Phe Thr Gln Tyr
115 120 125

Trp Ser Val Arg Gln Ser Lys Arg Pro Thr Gly Ser Asn Ala Thr Ile
130 135 140

Thr Phe Ser Asn His Val Asn Ala Trp Lys Ser His Gly Met Asn Leu
145 150 155 160

Gly Ser Asn Trp Ala Tyr Gln Val Met Ala Thr Glu Gly Tyr Gln Ser
165 170 175

Ser Gly Ser Ser Asn Val Thr Val Trp
180 185

<210> 6

<211> 211

<212> PRT

<213> Clostridium acetobutylicum

<400> 6

Ser Ala Phe Asn Thr Gln Ala Ala Pro Lys Thr Ile Thr Ser Asn Glu
1 5 10 15

Ile Gly Val Asn Gly Gly Tyr Asp Tyr Glu Leu Trp Lys Asp Tyr Gly
20 25 30

Asn Thr Ser Met Thr Leu Lys Asn Gly Gly Ala Phe Ser Cys Gln Trp
35 40 45

Ser Asn Ile Gly Asn Ala Leu Phe Arg Lys Gly Lys Lys Phe Asn Asp
50 55 60

Thr Gln Thr Tyr Lys Gln Leu Gly Asn Ile Ser Val Asn Tyr Asn Cys
65 70 75 80

Asn Tyr Gln Pro Tyr Gly Asn Ser Tyr Leu Cys Val Tyr Gly Trp Thr
85 90 95

Ser Ser Pro Leu Val Glu Tyr Tyr Ile Val Asp Ser Trp Gly Ser Trp
100 105 110

Arg Pro Pro Gly Gly Thr Ser Lys Gly Thr Ile Thr Val Asp Gly Gly
115 120 125

Ile Tyr Asp Ile Tyr Glu Thr Thr Arg Ile Asn Gln Pro Ser Ile Gln
130 135 140

Gly Asn Thr Thr Phe Lys Gln Tyr Trp Ser Val Arg Arg Thr Lys Arg
145 150 155 160

Thr Ser Gly Thr Ile Ser Val Ser Lys His Phe Ala Ala Trp Glu Ser
165 170 175

ATTORNEY DOCKET NO. 07121.0003U1

Lys Gly Met Pro Leu Gly Lys Met His Glu Thr Ala Phe Asn Ile Glu
180 185 190

Gly Tyr Gln Ser Ser Gly Lys Ala Asp Val Asn Ser Met Ser Ile Asn
195 200 205

Ile Gly Lys
210

<210> 7

<211> 206

<212> PRT

<213> Clostridium stercorarium

<400> 7

Gly Arg Ile Ile Tyr Asp Asn Glu Thr Gly Thr His Gly Gly Tyr Asp
1 5 10 15

Tyr Glu Leu Trp Lys Asp Tyr Gly Asn Thr Ile Met Glu Leu Asn Asp
20 25 30

Gly Gly Thr Phe Ser Cys Gln Trp Ser Asn Ile Gly Asn Ala Leu Phe
35 40 45

Arg Lys Gly Arg Lys Phe Asn Ser Asp Lys Thr Tyr Gln Glu Leu Gly
50 55 60

Asp Ile Val Val Glu Tyr Gly Cys Asp Tyr Asn Pro Asn Gly Asn Ser
65 70 75 80

Tyr Leu Cys Val Tyr Gly Trp Thr Arg Asn Phe Leu Val Glu Tyr Tyr
85 90 95

Ile Val Glu Ser Trp Gly Ser Trp Arg Pro Pro Gly Ala Thr Pro Lys
100 105 110

Gly Thr Ile Thr Gln Trp Met Ala Gly Thr Tyr Glu Ile Tyr Glu Thr
115 120 125

Thr Arg Val Asn Gln Pro Ser Ile Asp Gly Thr Ala Thr Phe Gln Gln
130 135 140

Tyr Trp Ser Val Arg Thr Ser Lys Arg Thr Ser Gly Thr Ile Ser Val
145 150 155 160

Thr Glu His Phe Lys Gln Trp Glu Arg Met Gly Met Arg Met Gly Lys
165 170 175

Met Tyr Glu Val Ala Leu Thr Val Glu Gly Tyr Gln Ser Ser Gly Tyr
180 185 190

Ala Asn Val Tyr Lys Asn Glu Ile Arg Ile Gly Ala Asn Pro
195 200 205

ATTORNEY DOCKET NO. 07121.0003U1

<210> 8

<211> 211

<212> PRT

<213> Ruminococcus flavefaciens

<400> 8

Ser Ala Ala Asp Gln Gln Thr Arg Gly Asn Val Gly Gly Tyr Asp Tyr
1 5 10 15

Glu Met Trp Asn Gln Asn Gly Gln Gly Gln Ala Ser Met Asn Pro Gly
20 25 30

Ala Gly Ser Phe Thr Cys Ser Trp Ser Asn Ile Glu Asn Phe Leu Ala
35 40 45

Arg Met Gly Lys Asn Tyr Asp Ser Gln Lys Lys Asn Tyr Lys Ala Phe
50 55 60

Gly Asn Ile Val Leu Thr Tyr Asp Val Glu Tyr Thr Pro Arg Gly Asn
65 70 75 80

Ser Tyr Met Cys Val Tyr Gly Trp Thr Arg Asn Pro Leu Met Glu Tyr
85 90 95

Tyr Ile Val Glu Gly Trp Gly Asp Trp Arg Pro Pro Gly Asn Asp Gly
100 105 110

Glu Val Lys Gly Thr Val Ser Ala Asn Gly Asn Thr Tyr Asp Ile Arg
115 120 125

Lys Thr Met Arg Tyr Asn Gln Pro Ser Leu Asp Gly Thr Ala Thr Phe
130 135 140

Pro Gln Tyr Trp Ser Val Arg Gln Thr Ser Gly Ser Ala Asn Asn Gln
145 150 155 160

Thr Asn Tyr Met Lys Gly Thr Ile Asp Val Ser Lys His Phe Asp Ala
165 170 175

Trp Ser Ala Ala Gly Leu Asp Met Ser Gly Thr Leu Tyr Glu Val Ser
180 185 190

Leu Asn Ile Glu Gly Tyr Arg Ser Asn Gly Ser Ala Asn Val Lys Ser
195 200 205

Val Ser Val
210

<210> 9

<211> 197

<212> PRT

ATTORNEY DOCKET NO. 07121.0003U1

<213> Schizophyllum cimmune

<400> 9

Ser Gly Thr Pro Ser Ser Thr Gly Thr Asp Gly Gly Tyr Tyr Tyr Ser
 1 5 10 15
 Trp Trp Thr Asp Gly Ala Gly Asp Ala Thr Tyr Gln Asn Asn Gly Gly
 20 25 30
 Gly Ser Tyr Thr Leu Thr Trp Ser Gly Asn Asn Gly Asn Leu Val Gly
 35 40 45
 Gly Lys Gly Trp Asn Pro Gly Ala Ala Ser Arg Ser Ile Ser Tyr Ser
 50 55 60
 Gly Thr Tyr Gln Pro Asn Gly Asn Ser Tyr Leu Ser Val Tyr Gly Trp
 65 70 75 80
 Thr Arg Ser Ser Leu Ile Glu Tyr Tyr Ile Val Glu Ser Tyr Gly Ser
 85 90 95
 Tyr Asp Pro Ser Ser Ala Ala Ser His Lys Gly Ser Val Thr Cys Asn
 100 105 110
 Gly Ala Thr Tyr Asp Ile Leu Ser Thr Trp Arg Tyr Asn Ala Pro Ser
 115 120 125
 Ile Asp Gly Thr Gln Thr Phe Glu Gln Phe Trp Ser Val Arg Asn Pro
 130 135 140
 Lys Lys Ala Pro Gly Gly Ser Ile Ser Gly Thr Val Asp Val Gln Cys
 145 150 155 160
 His Phe Asp Ala Trp Lys Gly Leu Gly Met Asn Leu Gly Ser Glu His
 165 170 175
 Asn Tyr Gln Ile Val Ala Thr Glu Gly Tyr Gln Ser Ser Gly Thr Ala
 180 185 190
 Thr Ile Thr Val Thr
 195

<210> 10

<211> 191

<212> PRT

<213> Streptomyces lividans Xyl B

<400> 10

Asp Thr Val Val Thr Thr Asn Gln Glu Gly Thr Asn Asn Gly Tyr Tyr
 1 5 10 15

ATTORNEY DOCKET NO. 07121.0003U1

Tyr Ser Phe Trp Thr Asp Ser Gln Gly Thr Val Ser Met Asn Met Gly
 20 25 30
 Ser Gly Gly Gln Tyr Ser Thr Ser Trp Arg Asn Thr Gly Asn Phe Val
 35 40 45
 Ala Gly Lys Gly Trp Ala Asn Gly Gly Arg Arg Thr Val Gln Tyr Ser
 50 55 60
 Gly Ser Phe Asn Pro Ser Gly Asn Ala Tyr Leu Ala Leu Tyr Gly Trp
 65 70 75 80
 Thr Ser Asn Pro Leu Val Glu Tyr Tyr Ile Val Asp Asn Trp Gly Thr
 85 90 95
 Tyr Arg Pro Thr Gly Glu Tyr Lys Gly Thr Val Thr Ser Asp Gly Gly
 100 105 110
 Thr Tyr Asp Ile Tyr Lys Thr Thr Arg Val Asn Lys Pro Ser Val Glu
 115 120 125
 Gly Thr Arg Thr Phe Asp Gln Tyr Trp Ser Val Arg Gln Ser Lys Arg
 130 135 140
 Thr Gly Gly Thr Ile Thr Thr Gly Asn His Phe Asp Ala Trp Ala Arg
 145 150 155 160
 Ala Gly Met Pro Leu Gly Asn Phe Ser Tyr Tyr Met Ile Asn Ala Thr
 165 170 175
 Glu Gly Tyr Gln Ser Ser Gly Thr Ser Ser Ile Asn Val Gly Gly
 180 185 190

<210> 11

<211> 191

<212> PRT

<213> Streptomyces lividans Kyl C

<400> 11

Ala Thr Thr Ile Thr Thr Asn Gln Thr Gly Thr Asp Gly Met Tyr Tyr
 1 5 10 15
 Ser Phe Trp Thr Asp Gly Gly Gly Ser Val Ser Met Thr Leu Asn Gly
 20 25 30
 Gly Gly Ser Tyr Ser Thr Gln Trp Thr Asn Cys Gly Asn Phe Val Ala
 35 40 45
 Gly Lys Gly Trp Ser Thr Gly Asp Gly Asn Val Arg Tyr Asn Gly Tyr
 50 55 60
 Phe Asn Pro Val Gly Asn Gly Tyr Gly Cys Leu Tyr Gly Trp Thr Ser
 65 70 75 80

ATTORNEY DOCKET NO. 07121.0003U1

Gly Thr Ile Thr Thr Gly Asn His Phe Asp Ala Trp Ala Arg Ala Gly
145 150 155 160

Met Asn Met Gly Asn Phe Arg Tyr Tyr Met Ile Asn Ala Thr Glu Gly
165 170 175

Tyr Gln Ser Ser Gly Ser Ser Thr Ile Thr Val Ser Gly
180 185

<210> 13

<211> 189

<212> PRT

<213> Thermomonospora fusca

<400> 13

Ala Val Thr Ser Asn Glu Thr Gly Tyr His Asp Gly Tyr Phe Tyr Ser
1 5 10 15

Phe Trp Thr Asp Ala Pro Gly Thr Val Ser Met Glu Leu Gly Pro Gly
20 25 30

Gly Asn Tyr Ser Thr Ser Trp Arg Asn Thr Gly Asn Phe Val Ala Gly
35 40 45

Lys Gly Trp Ala Thr Gly Gly Arg Arg Thr Val Thr Tyr Ser Ala Ser
50 55 60

Phe Asn Pro Ser Gly Asn Ala Tyr Leu Thr Leu Tyr Gly Trp Thr Arg
65 70 75 80

Asn Pro Leu Val Glu Tyr Tyr Ile Val Glu Ser Trp Gly Thr Tyr Arg
85 90 95

Pro Thr Gly Thr Tyr Met Gly Thr Val Thr Thr Asp Gly Gly Thr Tyr
100 105 110

Asp Ile Tyr Lys Thr Thr Arg Tyr Asn Ala Pro Ser Ile Glu Gly Thr
115 120 125

Arg Thr Phe Asp Gln Tyr Trp Ser Val Arg Gln Ser Lys Arg Thr Ser
130 135 140

Gly Thr Ile Thr Ala Gly Asn His Phe Asp Ala Trp Ala Arg His Gly
145 150 155 160

Met His Leu Gly Thr His Asp Tyr Met Ile Met Ala Thr Glu Gly Tyr
165 170 175

Gln Ser Ser Gly Ser Ser Asn Val Thr Leu Gly Thr Ser
180 185

<210> 14

ATTORNEY DOCKET NO. 07121.0003U1

<211> 190

<212> PRT

<213> Trichoderma harzanium

<400> 14

Gln Thr Ile Gly Pro Gly Thr Gly Tyr Ser Asn Gly Tyr Tyr Tyr Ser
1 5 10 15

Tyr Trp Asn Asp Gly His Ala Gly Val Thr Tyr Thr Asn Gly Gly Gly
20 25 30

Gly Ser Phe Thr Val Asn Trp Ser Asn Ser Gly Asn Phe Val Gly Gly
35 40 45

Lys Gly Trp Gln Pro Gly Thr Lys Asn Lys Val Ile Asn Phe Ser Gly
50 55 60

Ser Tyr Asn Pro Asn Gly Asn Ser Tyr Leu Ser Ile Tyr Gly Trp Ser
65 70 75 80

Arg Asn Pro Leu Ile Glu Tyr Tyr Ile Val Glu Asn Phe Gly Thr Tyr
85 90 95

Asn Pro Ser Thr Gly Ala Thr Lys Leu Gly Glu Val Thr Ser Asp Gly
100 105 110

Ser Val Tyr Asp Ile Tyr Arg Thr Gln Arg Val Asn Gln Pro Ser Ile
115 120 125

Ile Gly Thr Ala Thr Phe Tyr Gln Tyr Trp Ser Val Arg Arg Asn His
130 135 140

Arg Ser Ser Gly Ser Val Asn Thr Ala Asn His Phe Asn Ala Trp Ala
145 150 155 160

Ser His Gly Leu Thr Leu Gly Thr Met Asp Tyr Gln Ile Val Ala Val
165 170 175

Glu Gly Tyr Phe Ser Ser Gly Ser Ala Ser Ile Thr Val Ser
180 185 190

<210> 15

<211> 178

<212> PRT

<213> Trichoderma ressei Xyl I

ATTORNEY DOCKET NO. 07121.0003U1

<400> 15

Ala Ser Ile Asn Tyr Asp Gln Asn Tyr Gln Thr Gly Gly Gln Val Ser
 1 5 10 15

Tyr Ser Pro Ser Asn Thr Gly Phe Ser Val Asn Trp Asn Thr Gln Asp
 20 25 30

Asp Phe Val Val Gly Val Gly Trp Thr Thr Gly Ser Ser Ala Pro Ile
 35 40 45

Asn Phe Gly Gly Ser Phe Ser Val Asn Ser Gly Thr Gly Leu Leu Ser
 50 55 60

Val Tyr Gly Trp Ser Thr Asn Pro Leu Val Glu Tyr Tyr Ile Met Glu
 65 70 75 80

Asp Asn His Asn Tyr Pro Ala Gln Gly Thr Val Lys Gly Thr Val Thr
 85 90 95

Ser Asp Gly Ala Thr Tyr Thr Ile Trp Glu Asn Thr Arg Val Asn Glu
 100 105 110

Pro Ser Ile Gln Gly Thr Ala Thr Phe Asn Gln Tyr Ile Ser Val Arg
 115 120 125

Asn Ser Pro Arg Thr Ser Gly Thr Val Thr Val Gln Asn His Phe Asn
 130 135 140

Trp Ala Ser Leu Gly Leu His Leu Gly Gln Met Met Asn Tyr Gln Val
 145 150 155 160

Val Ala Val Glu Gly Trp Gly Gly Ser Gly Ser Ala Ser Gln Ser Val
 165 170 175

Ser Asn

<210> 16

<211> 190

<212> PRT

<213> Trichoderma reesei Kyl II

<400> 16

Gln Thr Ile Gln Pro Gly Thr Gly Tyr Asn Asn Gly Tyr Phe Tyr Ser
 1 5 10 15

Tyr Trp Asn Asp Gly His Gly Gly Val Thr Tyr Thr Asn Gly Pro Gly
 20 25 30

Gly Gln Phe Ser Val Asn Trp Ser Asn Ser Gly Asn Phe Val Gly Gly
 35 40 45

ATTORNEY DOCKET NO. 07121.0003U1

Lys Gly Trp Gln Pro Gly Thr Lys Asn Lys Val Ile Asn Phe Ser Gly
 50 55 60
 Ser Tyr Asn Pro Asn Gly Asn Ser Tyr Leu Ser Val Tyr Gly Trp Ser
 65 70 75 80
 Arg Asn Pro Leu Ile Glu Tyr Tyr Ile Val Glu Asn Phe Gly Thr Tyr
 85 90 95
 Asn Pro Ser Thr Gly Ala Thr Lys Leu Gly Glu Val Thr Ser Asp Gly
 100 105 110
 Ser Val Tyr Asp Ile Tyr Arg Thr Gln Arg Val Asn Gln Pro Ser Ile
 115 120 125
 Ile Gly Thr Ala Thr Phe Tyr Gln Tyr Trp Ser Val Arg Arg Asn His
 130 135 140
 Arg Ser Ser Gly Ser Val Asn Thr Ala Asn His Phe Asn Ala Trp Ala
 145 150 155 160
 Gln Gln Gly Leu Thr Leu Gly Thr Met Asp Tyr Gln Ile Val Ala Val
 165 170 175
 Glu Gly Tyr Phe Ser Ser Gly Ser Ala Ser Ile Thr Val Ser
 180 185 190

<210> 17

<211> 190

<212> PRT

<213> *Trichoderma viride*

<400> 17

Gln Thr Ile Gln Pro Gly Thr Gly Phe Asn Asn Gly Tyr Phe Tyr Ser
 1 5 10 15
 Tyr Trp Asn Asp Gly His Gly Gly Val Thr Tyr Thr Asn Gly Pro Gly
 20 25 30
 Gly Gln Phe Ser Val Asn Trp Ser Asn Ser Gly Asn Phe Val Gly Gly
 35 40 45
 Lys Gly Trp Gln Pro Gly Thr Lys Asn Lys Val Ile Asn Phe Ser Gly
 50 55 60
 Ser Tyr Asn Pro Asn Gly Asn Ser Tyr Leu Ser Val Tyr Gly Trp Ser
 65 70 75 80
 Arg Asn Pro Leu Ile Glu Tyr Tyr Ile Val Glu Asn Phe Gly Thr Tyr
 85 90 95
 Asn Pro Ser Thr Gly Ala Thr Lys Leu Gly Glu Val Thr Ser Asp Gly
 100 105 110

ATTORNEY DOCKET NO. 07121.0003U1

Ser Val Tyr Asp Ile Tyr Arg Thr Gln Arg Val Asn Gln Pro Ser Ile
115 120 125

Ile Gly Thr Ala Thr Phe Tyr Gln Tyr Trp Ser Val Arg Arg Thr His
130 135 140

Arg Ser Ser Gly Ser Val Asn Thr Ala Asn His Phe Asn Ala Trp Ala
145 150 155 160

Gln Gln Gly Leu Thr Leu Gly Thr Met Asp Tyr Gln Ile Val Ala Val
165 170 175

Glu Gly Tyr Phe Ser Ser Gly Ser Ala Ser Ile Thr Val Ser
180 185 190

<210> 18

<211> 202

<212> PRT

<213> Fibrobacter succinognees

<400> 18

Asn Ser Ser Val Thr Gly Asn Val Gly Ser Ser Pro Tyr His Tyr Glu
1 5 10 15

Ile Trp Tyr Gln Gly Gly Asn Asn Ser Met Thr Phe Tyr Asp Asn Gly
20 25 30

Thr Tyr Lys Ala Ser Trp Asn Gly Thr Asn Asp Phe Leu Ala Arg Val
35 40 45

Gly Phe Lys Tyr Asp Glu Lys His Thr Tyr Glu Glu Leu Gly Pro Ile
50 55 60

Asp Ala Tyr Tyr Lys Trp Ser Lys Gln Gly Ser Ala Gly Gly Tyr Asn
65 70 75 80

Tyr Ile Gly Ile Tyr Gly Trp Thr Val Asp Pro Leu Val Glu Tyr Tyr
85 90 95

Ile Val Asp Asp Trp Phe Asn Lys Pro Gly Ala Asn Leu Leu Gly Gln
100 105 110

Arg Lys Gly Glu Phe Thr Val Asp Gly Asp Thr Tyr Glu Ile Trp Gln
115 120 125

Asn Thr Arg Val Gln Gln Pro Ser Ile Lys Gly Thr Gln Thr Phe Pro
130 135 140

Gln Tyr Phe Ser Val Arg Lys Ser Ala Arg Ser Cys Gly His Ile Asp
145 150 155 160

Ile Thr Ala His Met Lys Lys Trp Glu Glu Leu Gly Met Lys Met Gly
165 170 175

ATTORNEY DOCKE1 NO. 07121.0003U1

Lys Met Tyr Glu Ala Lys Val Leu Val Glu Ala Gly Gly Gly Ser Gly
 180 185 190

Ser Phe Asp Val Thr Tyr Phe Lys Met Thr
 195 200

<210> 19

<211> 189

<212> PRT

<213> Asparigillus awamori var. kawachi

<400> 19

Arg Ser Thr Pro Ser Ser Thr Gly Glu Asn Asn Gly Tyr Tyr Tyr Ser
 1 5 10 15

Phe Trp Thr Asp Gly Gly Gly Asp Val Thr Tyr Thr Asn Gly Asn Ala
 20 25 30

Gly Ser Tyr Ser Val Glu Trp Ser Asn Val Gly Asn Phe Val Gly Gly
 35 40 45

Lys Gly Trp Asn Pro Gly Ser Ala Lys Asp Ile Thr Tyr Ser Gly Asn
 50 55 60

Phe Thr Pro Ser Gly Asn Gly Tyr Leu Ser Val Tyr Gly Trp Thr Thr
 65 70 75 80

Asp Pro Leu Ile Glu Tyr Tyr Ile Val Glu Ser Tyr Gly Asp Tyr Asn
 85 90 95

Pro Gly Ser Gly Gly Thr Thr Arg Gly Asn Val Ser Ser Asp Gly Ser
 100 105 110

Val Tyr Asp Ile Tyr Thr Ala Thr Arg Thr Asn Ala Pro Ser Ile Asp
 115 120 125

Gly Thr Gln Thr Phe Ser Gln Tyr Trp Ser Val Arg Gln Asn Lys Arg
 130 135 140

Val Gly Gly Thr Val Thr Thr Ser Asn His Phe Asn Ala Trp Ala Lys
 145 150 155 160

Leu Gly Met Asn Leu Gly Thr His Asn Tyr Gln Ile Leu Ala Thr Glu
 165 170 175

Gly Tyr Gln Ser Ser Gly Ser Ser Ser Ile Thr Ile Gln
 180 185

<210> 20

<211> 194

<212> PRT

ATTORNEY DOCKET NO. 07121.0003U1

<213> Thermomyces lanuginosus

<400> 20

Gln Thr Thr Pro Asn Ser Glu Gly Trp His Asp Gly Tyr Tyr Tyr Ser
1 5 10 15

Trp Trp Ser Asp Gly Gly Ala Gln Ala Thr Tyr Thr Asn Leu Glu Gly
20 25 30

Gly Thr Tyr Glu Ile Ser Trp Gly Asp Gly Gly Asn Leu Val Gly Gly
35 40 45

Lys Gly Trp Asn Pro Gly Leu Asn Ala Arg Ala Ile His Phe Glu Gly
50 55 60

Val Tyr Gln Pro Asn Gly Asn Ser Tyr Leu Ala Val Tyr Gly Trp Thr
65 70 75 80

Arg Asn Pro Leu Val Glu Tyr Tyr Ile Val Glu Asn Phe Gly Thr Tyr
85 90 95

Asp Pro Ser Ser Gly Ala Thr Asp Leu Gly Thr Val Glu Cys Asp Gly
100 105 110

Ser Ile Tyr Arg Leu Gly Lys Thr Thr Arg Val Asn Ala Pro Ser Ile
115 120 125

Asp Gly Thr Gln Thr Phe Asp Gln Tyr Trp Ser Val Arg Gln Asp Lys
130 135 140

Arg Thr Ser Gly Thr Val Gln Thr Gly Cys His Phe Asp Ala Trp Ala
145 150 155 160

Arg Ala Gly Leu Asn Val Asn Gly Asp His Tyr Tyr Gln Ile Val Ala
165 170 175

Thr Glu Gly Tyr Phe Ser Ser Gly Tyr Ala Arg Ile Thr Val Ala Asp
180 185 190

Val Gly

<210> 21

<211> 76

<212> DNA

<213> Artificial

<220>

<223> Trx-1

ATTORNEY DOCKET NO. 07121.0003U1

<400> 21
ctagctaagg aggctgcaga tgcaaacaat acaaccagga accggttaca acaacggtta 60
cttttacagc tattgg 76

<210> 22

<211> 78

<212> DNA

<213> Artificial

<220>

<223> XyTv-2

<400> 22
aacgatggcc atggtggtgt tacctataca aacggggccg gaggcccaatt tagcgtcaat 60
tgggtctaact ccggaaac 78

<210> 23

<211> 78

<212> DNA

<213> Artificial

<220>

<223> Trx-3

<400> 23
ttcgtaggty gaaaaggtyt gcaacccggg accaaaaata aggtgatcaa cttctctgga 60
tcttataatc cgaatggg 78

<210> 24

<211> 74

<212> DNA

<213> Artificial

<220>

<223> XyTv-4

<400> 24

ATTORNEY DOCKET NO. 07121.0003U1

aattcatact taagcgtcta tggctgggtct agaaaccac tgattgaata ttacattgtc 60
gaaaatttcg gtac 74

<210> 25

<211> 51

<212> DNA

<213> Artificial

<220>

<223> Trx-8

<400> 25
gattcctccg acgtctacgt ttgttatgtt ggtccttggc caatgttggt g 51

<210> 26

<211> 84

<212> DNA

<213> Artificial

<220>

<223> XyTv-7

<400> 26
ccaatgaaaa tgcgataac cttgctaccg gtaccaccac aatggatatg tttgcccggg 60
cctccgggta aatcgagtt aacc 84

<210> 27

<211> 78

<212> DNA

<213> Artificial

<220>

<223> Trx-6

<400> 27
agattgaggg ctttgaagca tccacotttt ccaacogttg ggccttggtt tttattccac 60
tagttgaaga gacctaga 78

ATTORNEY DOCKET NO. 07121.0003U1

<210> 28

<211> 85

<212> DNA

<213> Artificial

<220>

<223> XyTv-5

<400> 28

atattaggct tacccttaag tatgaattcg cagataccga ccagatcttt gggtgactaa 60

cttataatgt aacagctttt aaagc 85

<210> 29

<211> 58

<212> DNA

<213> Artificial

<220>

<223> XyTv-101

<400> 29

tcgacaattt cggtagctac aatccgagta ccggcgccac aaaattagga gaagtcac 58

<210> 30

<211> 53

<212> DNA

<213> Artificial

<220>

<223> XyTv-102

<400> 30

tagtgatgga tccgtatatg atatctacg tacccaacgc gtaatcagc cat 53

<210> 31

<211> 59

ATTORNEY DOCKET NO. 07121.0003U1

<212> DNA

<213> Artificial

<220>

<223> Trx-103

<400> 31
cgatcattgg aaccgccacc ttttatcagt actggagtgt tagacgtaat catcggagc 59

<210> 32

<211> 69

<212> DNA

<213> Artificial

<220>

<223> XyTv-104

<400> 32
tccggttcgg ttaatactgc gaatcacttt aatgcattgg cacagcaagg gttaacccta 60
ggtacaatg 69

<210> 33

<211> 67

<212> DNA

<213> Artificial

<220>

<223> XyTv-105

<400> 33
gattatcaaa tcgtagcggg ggaaggctac ttctcgagtg gttccgctag tattacagtg 60
agctaaa 67

<210> 34

<211> 73

<212> DNA

REAP 01/07 + BOLA ET 01/170001 0.17.17 AM IF... AL... T... .16 AM. HABTA FUROR 1/07 + BOLA.0700000 + ARIE. + RIIBETIALL /sum. cal.05 00

ATTORNEY DOCKET NO. 07121.0003U1

<400> 37
 ttagtgaaat tacgtaccgg tgctgtccc aattgggac catgttacct aatagtttag 60
 catcgc 66

<210> 38

<211> 53

<212> DNA

<213> Artificial

<220>

<223> XyTv-106

<400> 38
 caccttcga tgaagagctc accaaggcga tcataatgtc actcgatttc tag 53

<210> 39

<211> 596

<212> DNA

<213> Artificial

<220>

<223> TrX

<400> 39
 ctagctaagg aggtgcaga tgcaaacaat acaaccagga accgggtaca acaacggtta 60
 cttttacagc tattggaacg atggccatgg tgggtgtacc tatacaaacg ggcccgagg 120
 ccaatttagc gtcaattggt ctaactccgg aaacttcgta ggtggaaaag gttggcaacc 180
 cgggaccaa aataagggtga tcaacttctc tggatcttat aatccgaatg ggaattcata 240
 cttaaagcgtc tatggctggt ctagaaaccc actgattgaa tattacattg tcgaaaattt 300
 cggtaacctac aatccgagta ccggcgccac aaaattagge gaagtcacta gtgatggac 360
 cgtatatgat atctaccgta cccaacgcgt taatcagcca tcgatcattg gaaccgccac 420
 cttttatcag tactggagtg ttagacgtaa toatcggagc tccggttcgg ttaatactgc 480
 gaatcacttt aatgcattgg cacagcaagg gttaacccta ggtacaatgg attatcaaatt 540
 cgtagcggtg gaaggctact tctcgagtgg ttcgctagt attacagtga gctaaa 596

ATTORNEY DOCKET NO. 07121.0003U1

<210> 40

<211> 36

<212> DNA

<213> Artificial

<220>

<223> Tx-75A-1

<400> 40

tgggaattca taattagcgg tctatggctg gtctag

36

<210> 41

<211> 42

<212> DNA

<213> Artificial

<220>

<223> Tx-105H-1

<400> 41

accggcgcca caaaacaagg cgaagtcact agtgatggat cc

42

<210> 42

<211> 44

<212> DNA

<213> Artificial

<220>

<223> Tx-C1

<400> 42

ccaaggcgat cataatgtca ctcgatttct agaacttcga accc

44

<210> 43

<211> 36

<212> DNA

ATTORNEY DOCKET NO. 07121.0003U1

<213> Artificial

<220>

<223> Tx-del(123-144)-1r

<400> 43

cggagctccg acgcgttggg tacggtagat atcata

36

<210> 44

<211> 42

<212> DNA

<213> Artificial

<220>

<223> Tx-105R-1

<400> 44

acgggcgcca caaaaagagg cgaagtcact agtgatggat cc

42

<210> 45

<211> 41

<212> DNA

<213> Artificial

<220>

<223> Tx-N1

<400> 45

ctagctaagg aggctgcaga tgcaaacaat acaaccagga a

41

<210> 46

<211> 36

<212> DNA

<213> Artificial

<220>

<223> Tx-75-G1

ATTORNEY DOCKET NO. 07121.0003U1

<400> 46
tgggaattca tacttaggcg tctatggctg gtctag

36

<210> 47

<211> 54

<212> DNA

<213> Artificial

<220>

<223> Tx-144R-1r

<400> 47
ccatgcatta aagtgattcg cagtattaac cgaaccggag ctccgacgat tacgtctaac

60

actcca

66

<210> 48

<211> 44

<212> DNA

<213> Artificial

<220>

<223> Tx-161R-1r

<400> 48
gtacctaggg ttaacccttg ccgtgcccat gcattaaagt gatt

44

<210> 49

<211> 40

<212> DNA

<213> Artificial

<220>

<223> Tx-125A 129E-1

<400> 49
ccaacgcgtt aatgcgccat cgatcgaggg aaccgccacc

40

ATTORNEY DOCKET NO. 07121.0003U1

<210> 50

<211> 26

<212> DNA

<213> Artificial

<220>

<223> Tx-116G-1

<400> 50

gacggatccg tatatggtat ctaccg

26

<210> 51

<211> 36

<212> DNA

<213> Artificial

<220>

<223> Tx-118C-1

<400> 51

gacggatccg tatatgatat ctgcgtacc caacgc

36

<210> 52

<211> 39

<212> DNA

<213> Artificial

<220>

<223> Tx-10H11D-1

<400> 52

ggaaccgggtt accacgacgg ttactttttac agctattgg

39

<210> 53

<211> 36

<212> DNA

RAPID 04/07 + RAINB AT 0147000Z 01.17.17 RRR IF... Standard Time + AIRCRAFT REPORT 1065 + RRR-0700000Z + RRR- + RRRBTALH /mm hg) AC 00

ATTORNEY DOCKET NO. 07121.0003U1

<220>

<223> TrX-HML

<400> 56

ctagctaagg aggcgtgcaga tgcaaacaaat acaaccagga accgggttacc acaacgggta 60

cttttacagc tattggaacg atggccatgg aggcgtcaca atgactctgg gg 112

<210> 57

<211> 30

<212> PRT

<213> Artificial

<220>

<223> TrX-HML

<400> 57

Gln Thr Ile Gln Pro Gly Thr Gly Tyr His Asn Gly Tyr Phe Tyr Ser
1 5 10 15Tyr Trp Asn Asp Gly His Gly Gly Val Thr Met Thr Leu Gly
20 25 30

<210> 58

<211> 14

<212> PRT

<213> Artificial

<220>

<223> TX-105R-1

<400> 58

Thr Gly Ala Thr Lys Arg Gly Glu Val Thr Ser Asp Gly Ser
1 5 10

<210> 59

ATTORNEY DOCKET NO. 07121.0003U1

<211> 8

<212> PRT

<213> Artificial

<220>

<223> TX-C1

<400> 59

Gly Ser Ala Ser Ile Thr Val Ser
1 5

<210> 60

<211> 13

<212> PRT

<213> Artificial

<220>

<223> TX-75A-1

<400> 60

Asn Gly Asn Ser Tyr Leu Ala Val Tyr Gly Trp Ser Arg
1 5 10

<210> 61

<211> 13

<212> PRT

<213> Artificial

<220>

<223> TX-75G-1

<400> 61

ATTORNEY DOCKET NO. 07121.0003U1

Asn Gly Asn Ser Tyr Leu Gly Val Tyr Gly Trp Ser Arg
1 5 10

<210> 62

<211> 13

<212> PRT

<213> Artificial

<220>

<223> TX125A129E-1

<400> 62

Gln Arg Val Asn Ala Pro Ser Ile Glu Gly Thr Ala Thr
1 5 10

<210> 63

<211> 14

<212> PRT

<213> Artificial

<220>

<223> TX-105H-1

<400> 63

Thr Gly Ala Thr Lys His Gly Glu Val Thr Ser Asp Gly Ser
1 5 10

<210> 64

<211> 12

<212> PRT

ATTORNEY DOCKET NO. 07121.0003U1

<213> Artificial

<220>

<223> TX-del (123-144)-1r

<400> 64

Gly	Ser	Ser	Arg	Arg	Gln	Thr	Arg	Tyr	Ile	Asp	Tyr
1				5					10		

<210> 65

<211> 7

<212> PRT

<213> Artificial

<220>

<223> TX-N1

<400> 65

Gln	Thr	Ile	Gln	Pro	Gly	Thr
1			5			

<210> 66

<211> 22

<212> PRT

<213> Artificial

<220>

<223> TX-144R-1r

<400> 66

Trp	Ala	Asn	Phe	His	Asn	Ala	Thr	Asn	Val	Ser	Gly	Ser	Ser	Arg	Arg
1				5				10						15	

Asn	Arg	Arg	Val	Ser	Trp
			20		

ATTORNEY DOCKET NO. 07121.0003U1

<210> 67

<211> 15

<212> PRT

<213> Artificial

<220>

<223> TX-161R-1r

<400> 67

Thr	Gly	Leu	Thr	Leu	Gly	Gln	Arg	Ala	Trp	Ala	Asn	Phe	His	Asn
1				5					10					15

<210> 68

<211> 9

<212> PRT

<213> Artificial

<220>

<223> TX-116G-1

<400> 68

Asp	Gly	Ser	Val	Tyr	Gly	Ile	Tyr	Arg
1				5				

<210> 69

<211> 12

<212> PRT

<213> Artificial

<220>

<223> TX-118C-1

<400> 69

Asp	Gly	Ser	Val	Tyr	Asp	Ile	Cys	Arg	Thr	Gln	Arg
1				5					10		

ATTORNEY DOCKET NO. 07121.0003U1

<210> 70

<211> 13

<212> PRT

<213> Artificial

<220>

<223> TX-10H11D-1

<400> 70

Gly	Thr	Gly	Tyr	His	Asp	Gly	Tyr	Phe	Tyr	Ser	Tyr	Trp
1				5					10			

<210> 71

<211> 12

<212> PRT

<213> Artificial

<220>

<223> TX-116G118C-1

<400> 71

Asp	Gly	Ser	Val	Tyr	Gly	Ile	Cys	Arg	Thr	Gln	Arg
1					5					10	